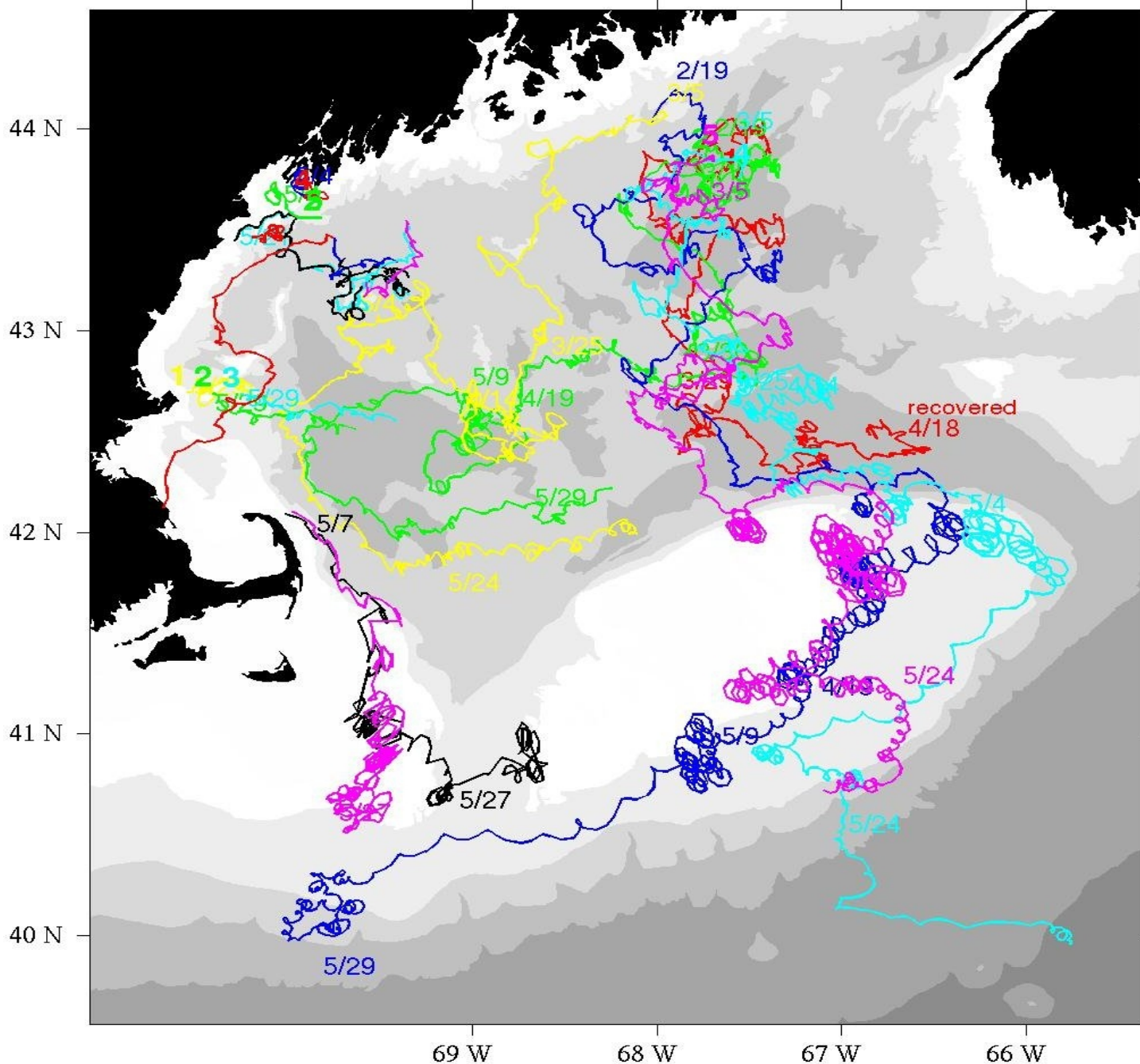


Drifter Report OC447 GOMTOX cruise

Two clusters of surface drifters were deployed on this cruise: 3 units off Cape Ann (north of Mass Bay) on 28 May and 6 units off Cape Small (northeast of Casco Bay) on 29 May. An additional lone surface drifter was deployed on 3 June on Phelps Bank (southeast corner of Nantucket Shoals). These deployments make a significant contribution to the compiled set of drifter tracks in 2008 (figure below). They add to the set deployed by an earlier GOMTOX cruise (off Cape Small) as well as those deployed by NOAA (in Jordan Basin in late Winter) and the University of New England (off Saco Bay in Southern Maine in late Spring).

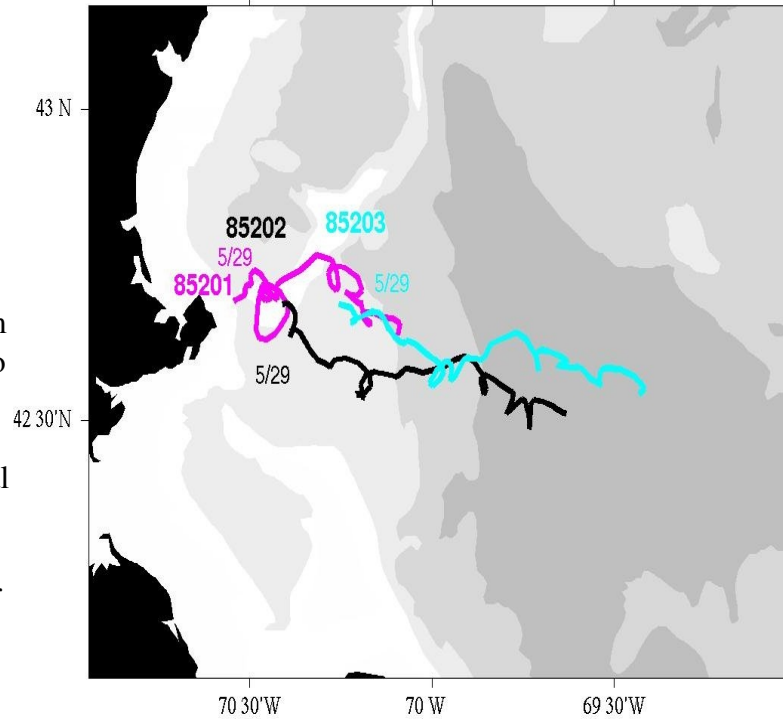
All 2008 Deployments as of 0712 local on 03-Jun-2008



Cape Ann/Mass Bay Cluster

As documented in the drifter log, these three units (85201-85203) were deployed along a transect running offshore with the central unit being on the top of southern-most ridge of Jeffrey's Ledge. The purposes in deploying them at this location were to a) add to the collection of deployments made at this location in the past and b) to document the potential transport of higher-than-normal concentrations of Alexandrium for this time of year. Since their mean velocities were near 15 cm/s towards the east, all three units moved away from the coast (figure to the right) and into Wilkinson Basin before the end of the cruise.

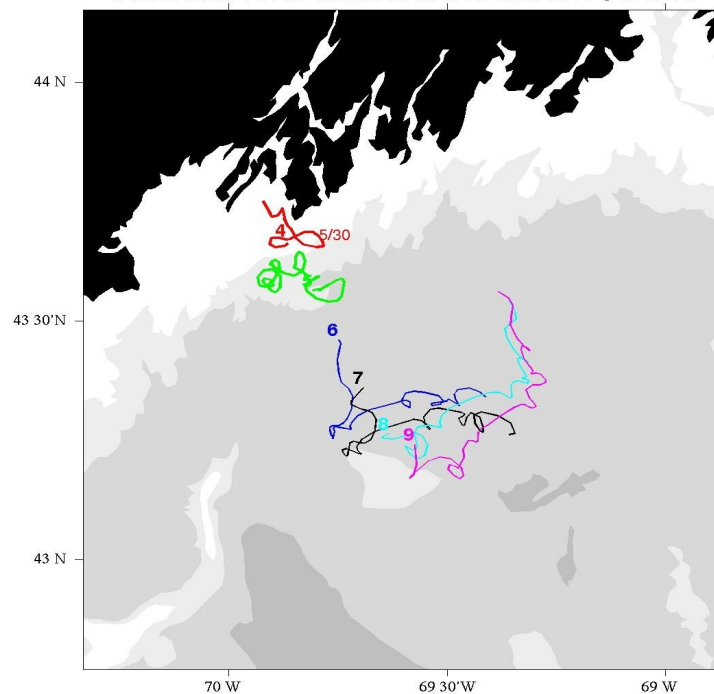
GOMTOX 2008 2nd Cluster as of 0946 local on 03-Jun-2008



Cape Ann Deployment depicting offshore flow.

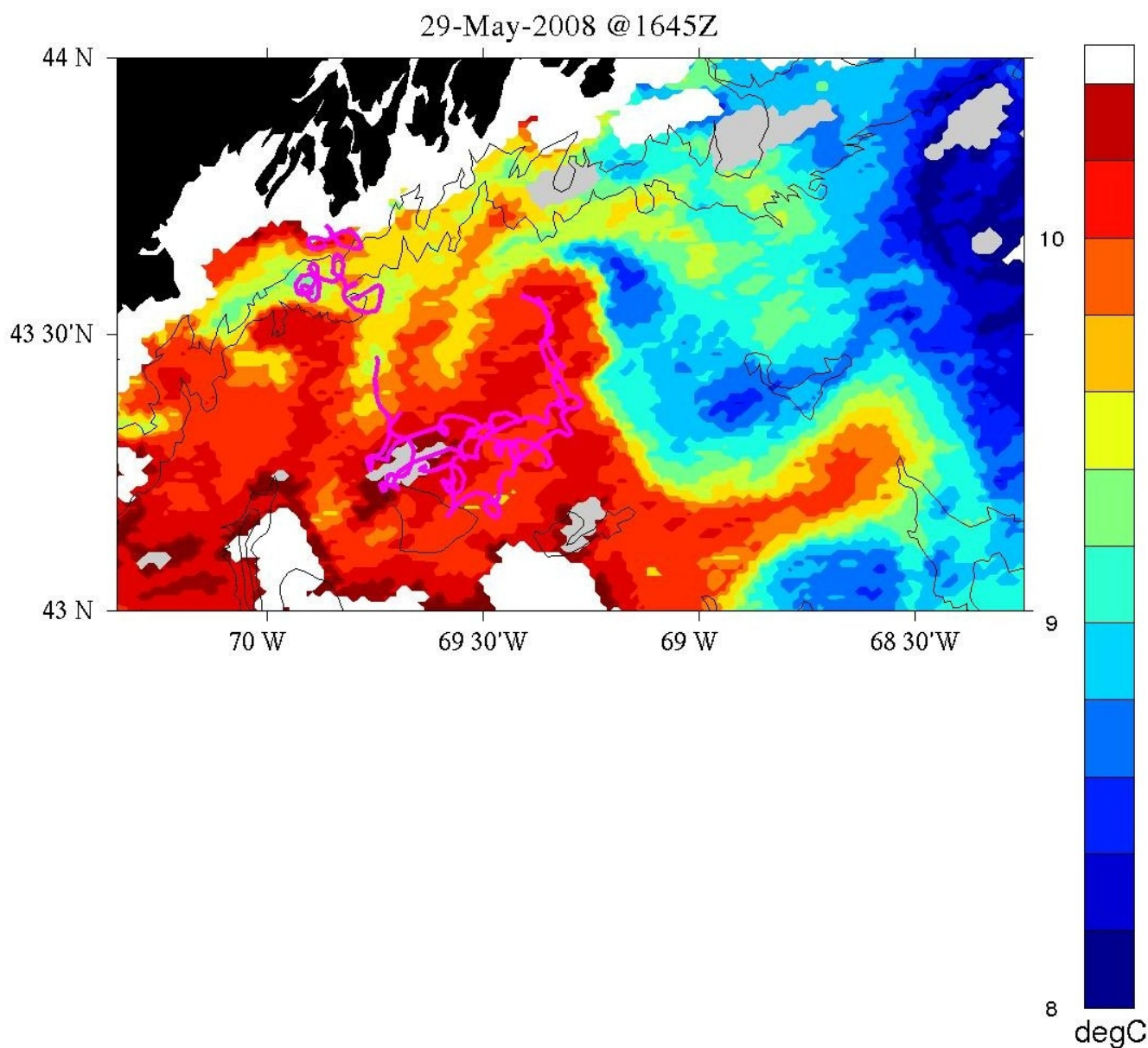
Cape Small/Casco Bay Cluster

GOMTOX 2008 3rd Cluster as of 0951 local on 03-Jun-2008



Cape Small deployment of drifters 85394-85399 depicting somewhat anomalous flow to the northeast in the offshore units.

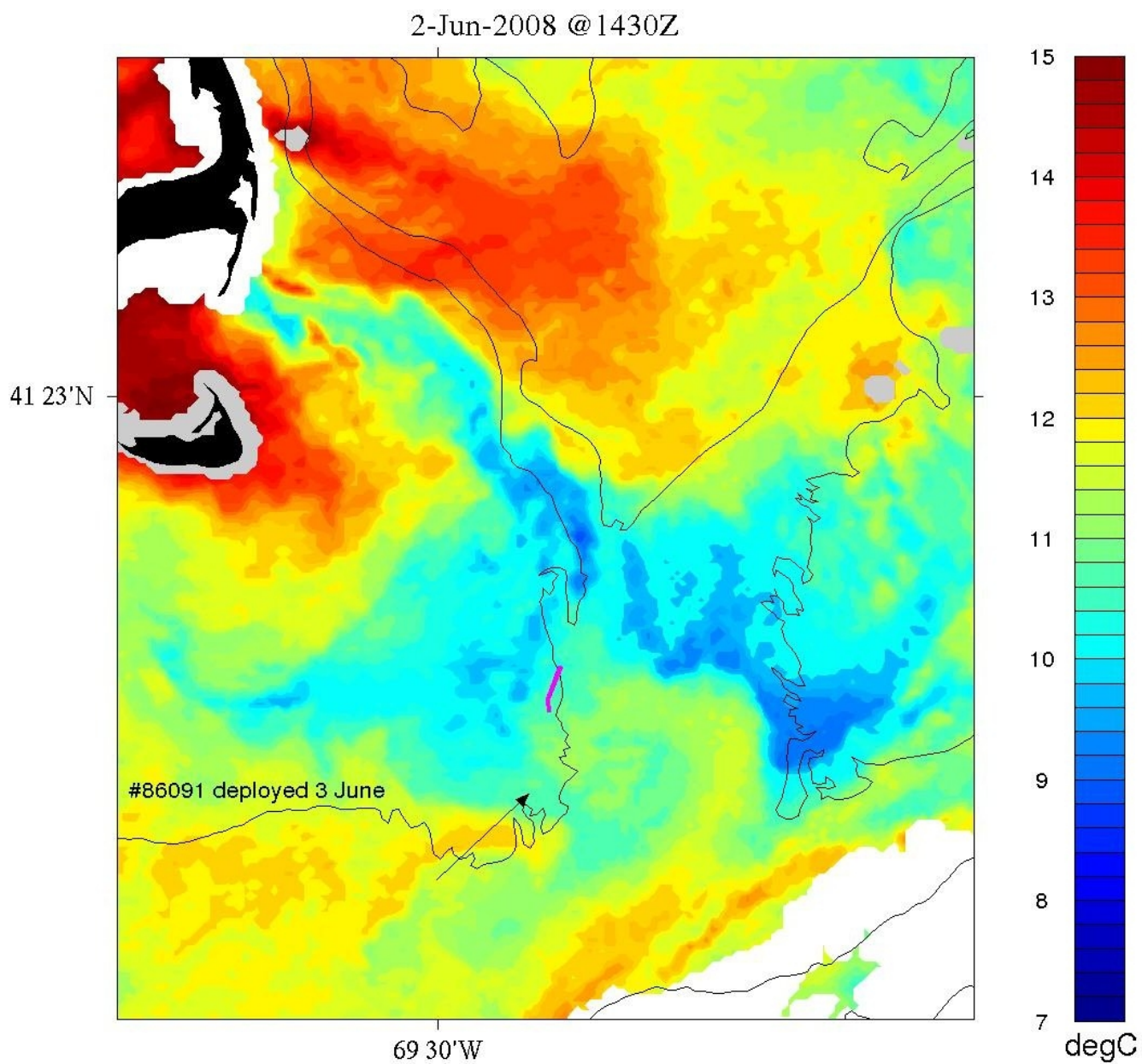
These six units (85394-85399) were deployed along a transect running offshore spanning water depths ranging from 32m to 174m. The shallow shoreward-most unit (#85394) moved quickly into Casco Bay and was recovered by a fisherman “about a half-mile from shore” near Harpswell, Maine (and then subsequently returned to the Southern Maine Community College by a student). The next unit offshore (#85395) appeared confused on which way to go. While it moved generally in the direction of the Western Maine Coastal Current, its progress over the course of the cruise period was slow and erratic. The other four units were advected more offshore and generally towards the northeast in a direction opposite the mean WMCC. This was especially the case for the two offshore-most units which were deployed in relatively shallow water (120m near Platt's Bank). The slow offshore flow observed by these mid-transect drifters contrast the fast southwestward advection of drifter (#85391) deployed in this area in early May (which ended up coming ashore inside Mass Bay in a little more than a week's time). While the strong and persistent winds from the southwest were probably the leading cause of this somewhat anomalous reverse flow, satellite imagery of this area shows multiple filaments of the Maine Coastal Current veering offshore with very little indication of WMCC penetrating the coastal waters south of Casco Bay. This type of complex structure will pose a significant challenge to numerical models when it is difficult to initialize the density fields sufficiently and accurately.



In the figure above, the drifters deployed off Casco Bay on the day the satellite-passed (29 May) are shown in magenta. The figure depicts the complex structure that, in addition to the wind effects, governed the drifters diverging paths.

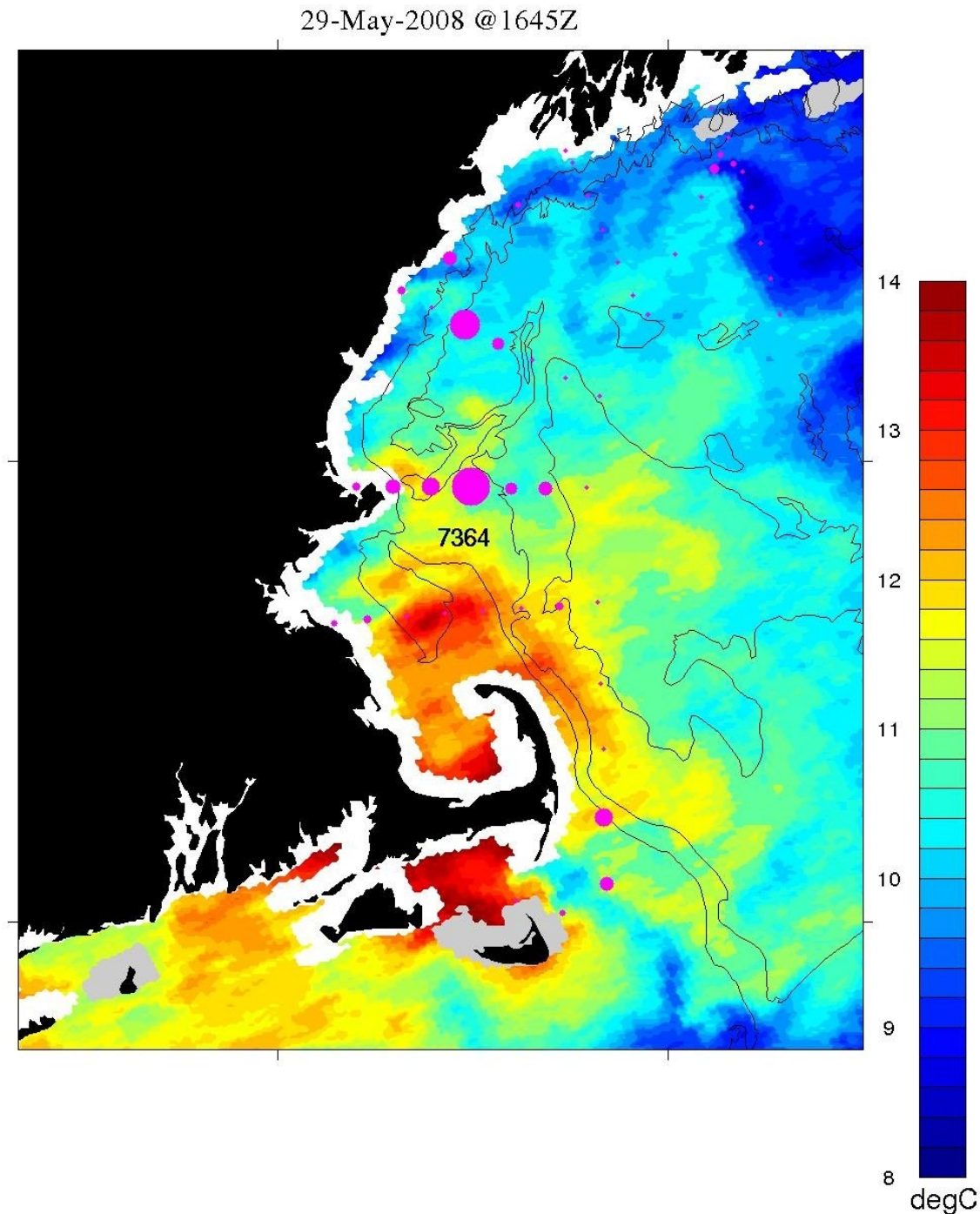
Phelps Bank/Nantucket Sound drifter

Drifter #86091 was deployed on the morning of 3 June in a tidally-active region of the Phelps Bank. It joins a unit already in this area, #85291, that was deployed off Cape Cod in early May by NOAA's marine mammal researchers and had been retained in this region for the last few weeks (see gulf-wide figure above). As usual, the tidal-fronts appear in the SST imagery (figure below) as well as small filaments of offshore slope water penetrating the Great South Channel.



In the figure above the magenta line indicates the track of #86091 soon after it was deployed on the morning of 3 June.

While the clear SST imagery on 29 May (courtesy of U Maine Orono School of Marine Science) depicted a lot of structure along the Western Gulf, it is not yet clear if and how the concentrations of Alexandrium are related to the various water masses. This investigation will take time. The figure below depicts small patches of cells that may or may not be associated with particular filaments as they appear in this single satellite pass.



Concentration of Alexandrium cells (magenta) overlaid on satellite-inferred SST for 29 May 2008. Peak abundance is shown off Cape Ann at 7364 cells/liter.

